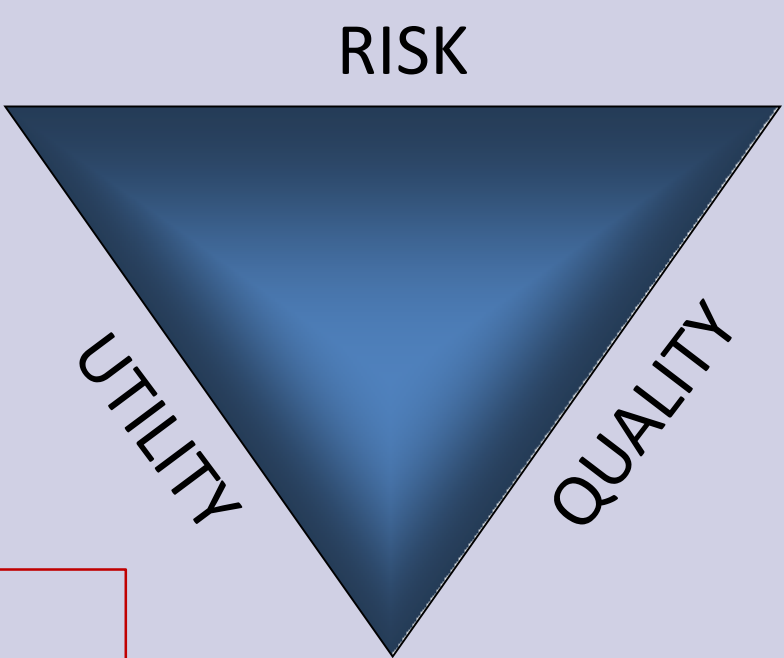


REDUCING DIAGNOSTIC ERROR IN MEDICINE

THROUGH STANDARDIZATION OF CLINICAL TERMINOLOGY AND DIAGNOSTIC NOSOLOGY

© 2017 Mark Gusack, M.D.

MANX Enterprises, Ltd.®



1. Describe how complexity of clinical terminology and diagnostic nosology reduces the accuracy of epidemiologic data. 2. Explain how inaccurate epidemiologic data has led to systematic Diagnostic Error in Medicine. 3. Show how, until this confusion is resolved through a synoptic based eHR using standardized clinical terminology and diagnostic nosology, systematic Reduction of Diagnostic Error in Medicine will be difficult to achieve.

SITUATION

Much of the statistical data regarding **Diagnostic Error in Medicine** is reliant on epidemiological data gathered through sources that include but are not limited to death certificates, tumor registries, state health agency reports, and hospital based chart reviews.

The heterogeneity and ever changing nature of reporting terminology used by clinicians and classification systems employed by collecting agencies has prevented the establishment of a standardized diagnostic nosology. This has led to inaccurate documentation of causes of morbidity and mortality making it difficult to validate the power of diagnostic tests as well as clinical criteria leading to increased **Diagnostic Error in Medicine**.

PROBLEM

How can we

RISK	Maximize patient safety through use of accurate and precise diagnostic terminology
QUALITY	Minimize discomfort and the pain suffered due to misdiagnosis caused by inaccurate terminology
UTILITY	Minimize expenditure of scarce resources through improved value of epidemiologic data through accurate terminology

SOLUTION

It is proposed that the Electronic Health Record [eHR] be structured to include predefined standardized clinical terminology synoptically organized to allow for self categorizing entries that are also self coding, linking each synoptic element to the presenting clinical case as well as to final diagnoses and therapies. The synoptic patient record would provide the means of assuring:

- ➔ Uniform diagnostic terminology leading to
- ➔ Uniform diagnostic classifications leading to
- ➔ Uniform epidemiologic categorizations leading to
- ➔ Reliable tracking of diagnostic accuracy and therapeutic efficacy

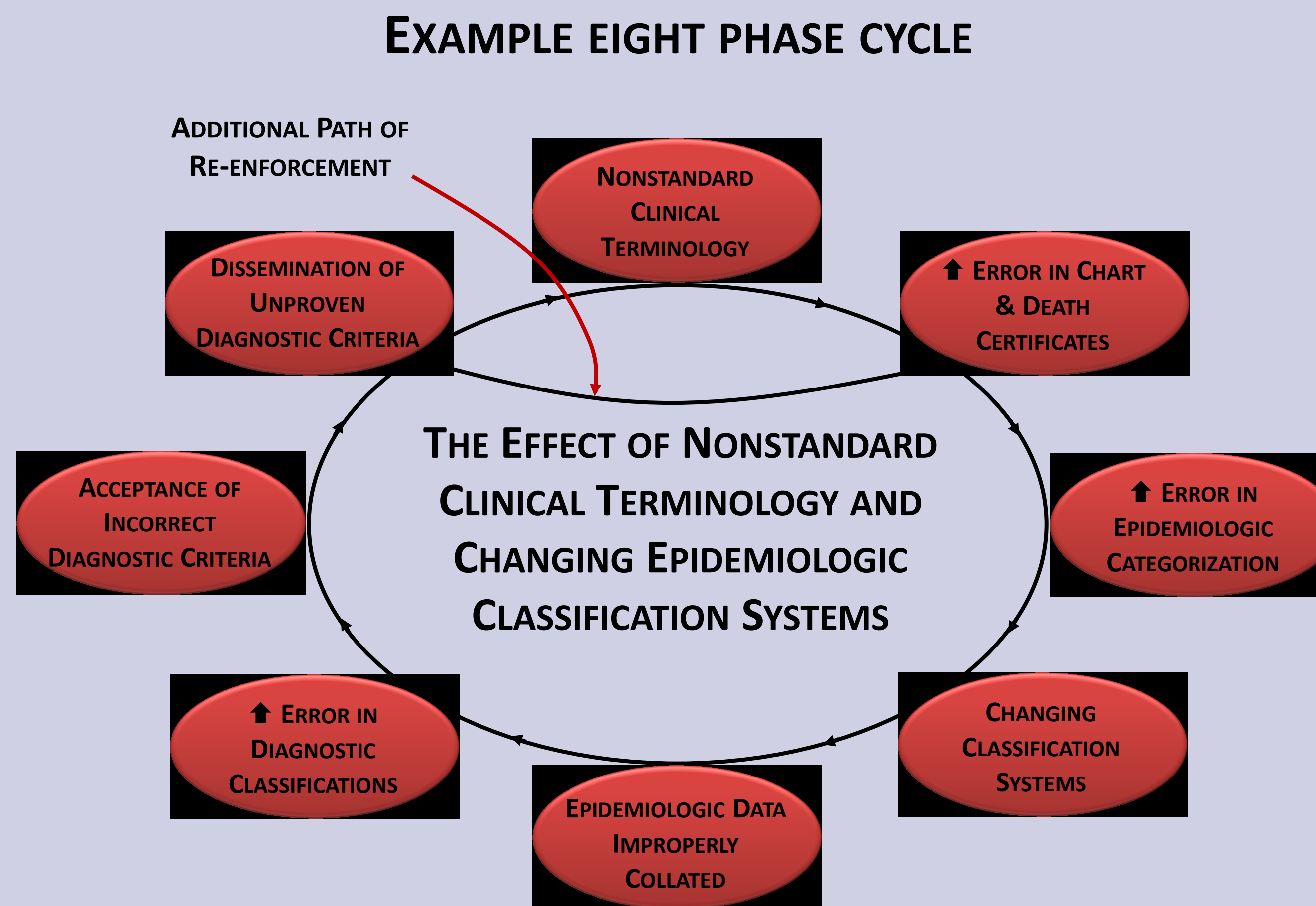
IMPLEMENTATION

A literature search was carried out regarding issues related to the collection, classification, and reporting of epidemiologic data. Numerous problems were identified going back over a century.

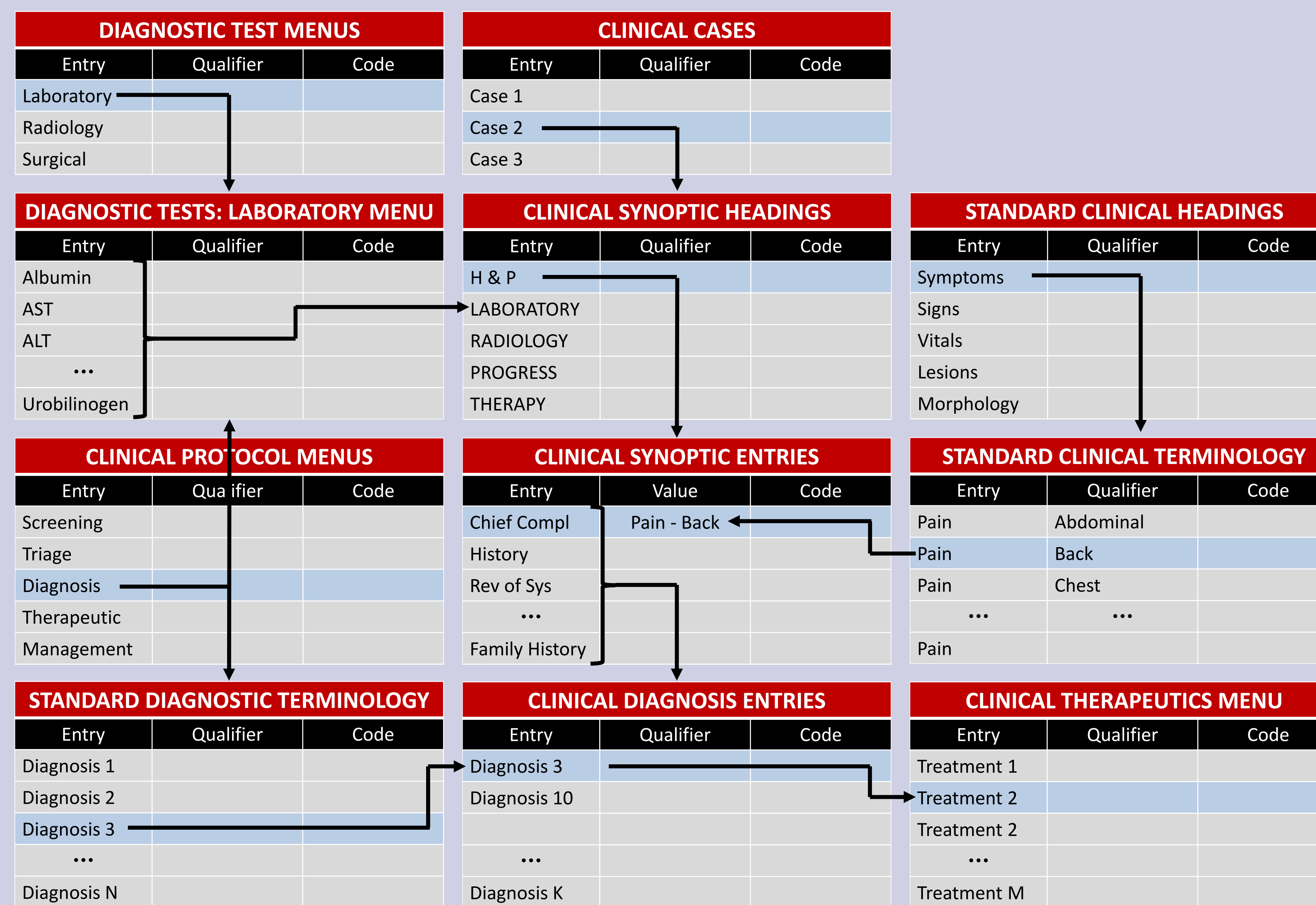
A schematic model was developed to illustrate the impact this can have on **Diagnostic Error in Medicine**.

Presented is a model schema of how standardized clinical terminology can be organized synoptically to generate a well ordered eHR that supports collection and analysis of epidemiologic data.

THE FEED FORWARD CYCLE



SIMPLIFIED SCHEMA FOR A PROPOSED SYNOPTIC EHR



- ➔ The above schema is meant to show how the various parts of the eHR could be structure and linked into a central table of **CLINICAL SYNOPTIC ENTRIES**. Predefined terminology is precoded to assure accurate epidemiologic data.
- ➔ What it does not show is how the user interface will be automated to facilitate this approach to assure efficient documentation, coding, and reporting of epidemiologic data while reducing provider time entering clinical information.

REFERENCES – SELECTED:
 1. Schwartz LM Woloshin S; **Changing Disease Definitions: Implications for Disease Prevalence**; Effective Clinical Practice Vol 2 No 2 Mar/Apr 1999 p 76 – 85.
 2. Paul JR; **Clinical Epidemiology: President's Address**; Journal of Clinical Investigation 2 May 1938 p 539 – 541.
 3. Burnand B Feinstein AR; **The Role of Diagnostic Inconsistency in Changing Rates of Occurrence for Coronary Heart Disease**; Journal of Clinical Epidemiology Vol 45 No 9 1992 p 929 – 940.
 4. James G Patton RE Heslin AS; **Accuracy of Cause-of-Death Statements on Death Certificates**; Public Health Reports Vol 70 No 1 Jan 1955 p 39 – 51.
 5. El-Kareh R Hasan O Schiff GD; **Use of Health Information Technology to Reduce Diagnostic Errors**; BMJ Quality and Safety Vol 22 Jul 2013 p ii40 – ii51.
 6. Abdelhak M et al; **Health Information: Management of a Strategic Resource**; W.B. Saunders Co. 1996 Chapter 7 Coding and Classification Systems p 215 – 235.
 ACKNOWLEDGEMENTS: William S. Yamamoto, M.D., PhD. Clinical Engineering The GWU Medical School 1975 and 1979.

COST BENEFIT ANALYSIS

I have reviewed thousands of patient charts over a forty year period for clinical and risk management purposes and have determined that retrospective coding of vague clinical terminology done by personnel who are not directly involved in clinical care leads to systematic error at the chart level, and so, at the epidemiologic level.

Additional errors occur upon reporting morbidity and mortality. Fixing this problem will greatly improve:

- ➔ Patient safety through systematized terminology and nosology
- ➔ Quality of patient care resulting increased accuracy in diagnosis
- ➔ Value of clinical practice greatly improved by eliminating huge costs

EXAMPLE

The result of the study reveals that, in the past, changes in incidence, prevalence, and mortality rates have been influenced by:

- ➔ Changing, poorly defined clinical terminology used by physicians
- ➔ Classification systems used by state and national repositories, as well as
- ➔ Changes in diagnostic nosology as a diagnosis evolves [See other Poster]

This is, in part, due to advances in scientific knowledge leading to new terminology and new diagnoses. In addition, we face a big problem moving from ICD9 to ICD10 where significant differences and gaps between the two classification systems will influence the reliability of epidemiologic data adversely affecting diagnostic medicine.

In addition, the number of categorizations has risen from about 175 for ICD1 in the early 1900's to over 250,000 with ICD10 by 2010. This inflation of codes presents an unsurmountable problem regarding generation of reliable epidemiologic data using present eHRs.

To the left is a simplified schema showing the cycle leading to this problem and below a simplified data schema for a synoptic eHR to generate reliable clinical terminology that leads to more accurate diagnoses which automatically code to assure accurate epidemiologic data that leads back to better diagnostic criteria.

Qualifiers and Codes are removed to avoid crowding the illustration.

CONCLUSION

The complexity of clinical terminology and diagnostic nosology reduces the accuracy of epidemiologic data. Inaccurate epidemiologic data has led to systematic **Diagnostic Error in Medicine**.

Until this confusion is resolved through development and deployment of synoptic eHRs with standardized clinical terminology and diagnostic nosology, systematic:

REDUCTION OF DIAGNOSTIC ERROR IN MEDICINE

will be difficult if not impossible to achieve.